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THE TERMINAL GRAIN ELEVATORS



LAKEHEAD HARBOUR
Canada's Mid-Continent Seaport

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THE LAKEHEAD HARBOUR

This Port, with 25 Terminal Grain Elevators having a storage capacity of 106,000,000 bushels, is recognized as one of the world's greatest concentrations of bulk grain storage.

The potential receiving and shipping capacity of its Terminals has never been taxed to the limit.

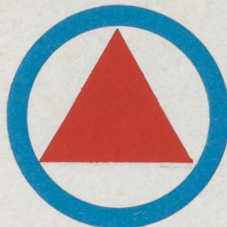
The Harbour plays a most strategic and important role in forwarding Western Canada grain to the markets of the world.



CANADA MALTING CO. LIMITED



N. M. PATERSON & SONS LIMITED



FEDERAL GRAIN LIMITED



JAMES RICHARDSON & SONS LTD.



MANITOBA POOL ELEVATORS



SASKATCHEWAN WHEAT POOL



MCCABE GRAIN COMPANY LIMITED



SEARLE GRAIN COMPANY LIMITED



NATIONAL GRAIN COMPANY LIMITED



UNITED GRAIN GROWERS LIMITED



PUBLISHED BY THE
LAKEHEAD HARBOUR
COMMISSION
MARCH 1966



PARISH & HEIMBECKER LIMITED

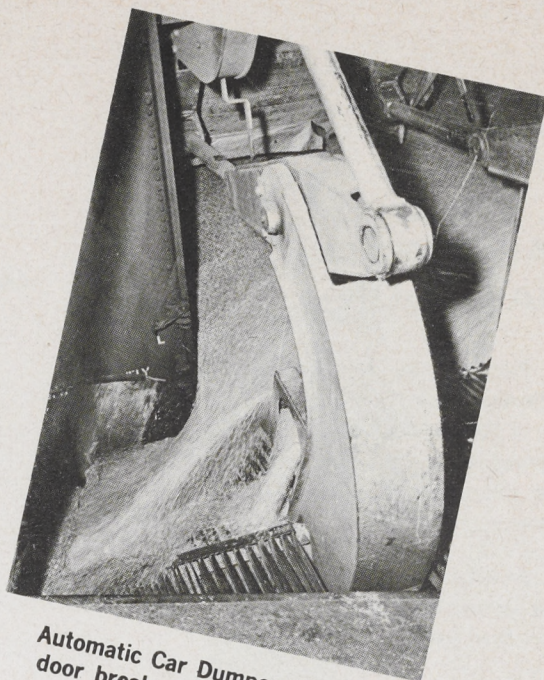


WESTLAND ELEVATOR LTD.

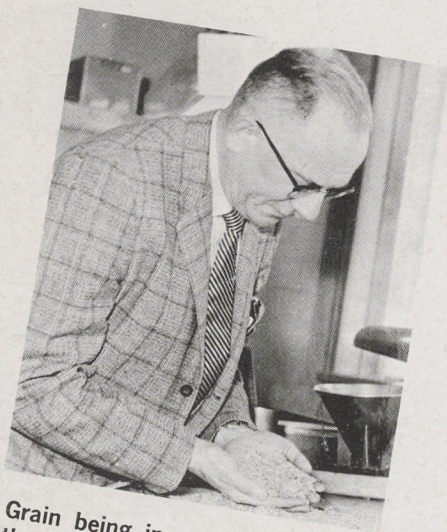
SIX STEPS OF GRAIN SAMPLING



Automatic Car Dumper showing railway car in dumping position



Automatic Car Dumper showing door breaker entering car and grain flowing.



Grain being inspected by one of the Supervisory staff of Canadian Board of Grain Commissioners.



Main inspection room—Board of Grain Commissioners Lakehead.



View of moisture tester—Board of Grain Commissioners — Lakehead



Storage Room of samples taken by Board of Grain Commissioners.

LAKEHEAD HARBOUR TERMINAL GRAIN ELEVATORS

Our Terminal Elevators are world renowned for their grain storage capacity, rating among the greatest for world ports. Only limited information is now available, however, as to the combined potential of the receiving, cleaning, drying and shipping capacities of the equipment installed in the 25 Terminal Elevator plants. These basic operations are primarily responsible for the part our Harbour plays in moving Canada's exportable grain to world markets.

In the year 1964 our Terminal grain Elevators moved 445,319,081 bushels of Western Canada grain and were responsible for 68.4% of the total tonnage handled by the Lakehead Harbour (12.8 million tons out of a total of 18.7 million tons). Forecast figures for the 1965 Western Canada grain crop indicate that in excess of seven hundred million bushels of wheat will be harvested, near an all-time record. Canada's export commitments already assure a maximum movement through the Lakehead Harbour during the 1965-66 crop year.

During the past two years the Harbour Commission has cooperated closely with the Canadian Wheat Board and the Board of Grain Commissioners in providing harbour tours for Trade Commissions from numerous countries overseas. Thousands of tourists from Canada and the U.S.A. have also visited our harbour. Many questions have been asked regarding the Terminal grain handling facilities and the Lakehead Harbour Commission feels that a brochure in this regard would be most informative.

Early in 1965 the management of all Grain Companies having Terminals at the Lakehead were unanimous in their approval that such a brochure would be beneficial. Complete information was provided by the elevator operators regarding their respective plants based on questionnaires distributed to all Elevators. These were later reviewed by a personal visit of representatives of the Harbour Commission to all Terminals.

Pertinent facts covering the combined potential of all Terminals for receiving, cleaning, drying and shipping to vessels and to railway boxcars for each Terminal Elevator are included in this brochure as an appendix listed as TABLE No. 1.

Grain in Canada is handled in bulk. The normal procedure is to preserve the identity of every car of grain only until its grade and weight has been established under government supervision at the Lakehead. Subsequent to this procedure the general practice, for convenient handling purposes, is to bulk together carlots of grain of the same type and grade.

Cars are hauled into the track shed section by means of a motor driven car puller cable and spotted directly over a receiving pit. The grain is then unloaded using hand operated shovel equipment or the more modern automatic boxcar unloader. The complete contents of each car is dumped into a track receiving hopper. The grain then passes along a conveyor belt to an elevator leg which, in order to take advantage of the gravity flowing quality of grain in bulk, lifts the grain to the top floor of the elevator workhouse. This elevator leg is equipped with a vertical rubber belt carrying small steel buckets. These legs vary in carrying capacity depending on the width of belt

and the size and spacing of the buckets. The normal elevator receiving and shipping legs in our Terminals are equipped with an 84 inch head pulley and operate at a belt spread of 688 feet per minute.

Conveyor belts in general operate at a speed of 850 feet per minute with capacities depending on the width of belting.

Each carlot of grain is discharged into and accumulated in the garner bin located on the garner floor directly below the top floor of the workhouse. It is then dropped by gravity into a hopper scale on the scale floor immediately below where it is weighed under government supervision.

From this point on, the grain may be dropped by gravity directly into a small workhouse bin to enable its further cleaning, processing or separation. It may also proceed directly to the large storage annex bins via a belt conveyor located on the bin floor.

Likewise, the procedure in shipping grain out from the Elevator via vessel or rail car is more direct than the receiving process. Grain in storage is drawn from the storage bins and carried on a basement conveyor belt back into the workhouse section. Here it is elevated to the top floor on a shipping elevator leg. It passes through the shipping garner and scale units and finally reaches the rail car via a special car loading spout, or it discharges into a small upper shipping bin and from here it reaches the waiting vessel via a boat loading spout operated from the dock level.

In general the typical modern grain Elevator at the Lakehead Harbour follows the design shown on sketch No. 1. Sections through the working house and storage units are included to indicate the various floors and the location of equipment thereon required to perform the normal primary functions of grain handling, including the unloading from cars, cleaning, elevating, weighing, and conveying grain to the storage bins. The equipment required to ship grain by both rail car and lake vessel is also shown on this sketch.

The following totals cover the combined potential of all Terminal Elevators:

- (1) There are 25 Terminal Elevators located on the Lakehead Harbour, 14 located on the open roadstead and 11 on the River systems.
- (2) The combined storage capacities for all 25 plants are as follows:

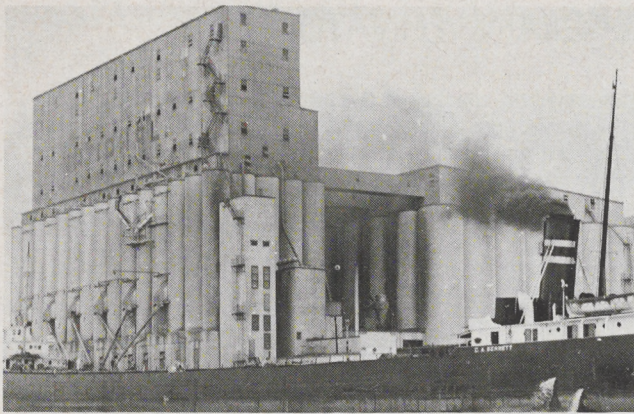
Workhouse Capacity	—8,621,900 bushels—	8.12%
Storage Capacity	—97,543,000 bushels—	91.88%

Total Capacity	—106,164,900 bushels—	100.00%
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NOTE:

TABLE No. 2 gives combined storage figures for elevators

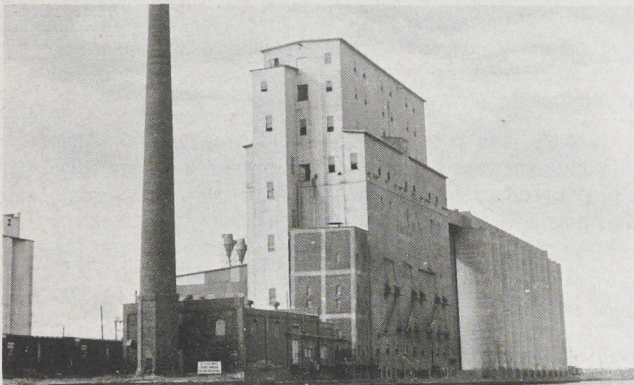




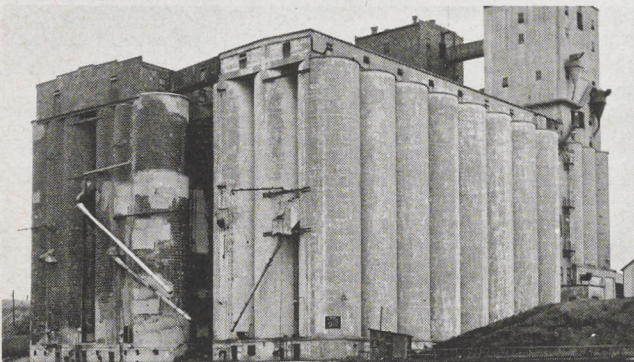
NATIONAL GRAIN COMPANY LIMITED



UNITED GRAIN GROWERS LIMITED
TERMINAL "A"



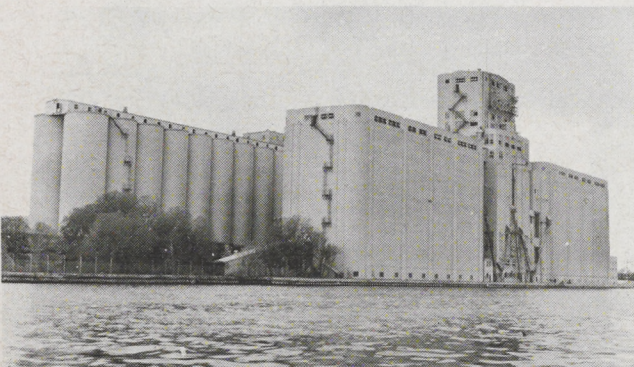
UNITED GRAIN GROWERS LIMITED
(THUNDER BAY)



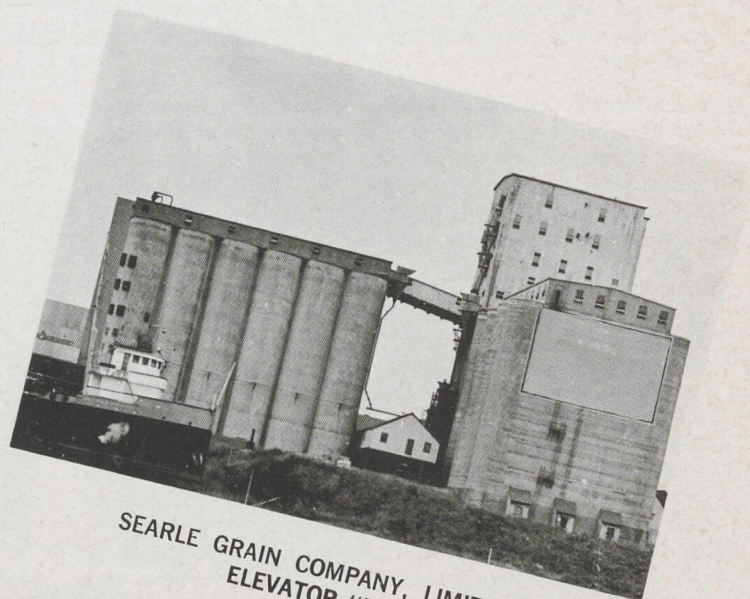
SASKATCHEWAN WHEAT POOL No. 11



N. M. PATERSON & SONS LIMITED



SEARLE GRAIN COMPANY, LIMITED
ELEVATOR "A"



SEARLE GRAIN COMPANY, LIMITED
ELEVATOR "B"

operated by the various Grain Companies at the Lakehead. The effective working capacity of the Terminal Elevators is said to be approximately 95 million bushels.

- (3) Twelve plants are switched by both C.P.R. and C.N.R.
 Nine plants are switched by C.P.R. only.
 Five plants are switched by C.N.R. only.

- (4) Railway trackage on elevator sites will accommodate 1675 loaded grain cars.

- (5) Railway trackage is also available at the sites for 1633 cars from which grain has been unloaded.

(6) Unloading Equipment

Automatic boxcar dumpers —21 units are located at 8 plants.
 Hand operated shovel pits —179 units located at all 25 plants.
 Combined unloading capacity—180 cars per hour or approximately 360,000 bushels per hour.

(7) Elevator legs

No. of Receiving Legs— 73 units for transferring grain from boxcar to Elevators.
 No. of Shipping Legs —105 units for loading out grain to cars and vessels.
 No. of Special Legs —197 units for cleaning and drying grain and for handling elevator screenings.

TOTAL —375 units

(8) Grain Hopper Scales

No. of Receiving Scales — 76 units varying in the main from 1000 to 2500 bushels cap.
 No. of Shipping Scales —102 units varying in the main from 1000 to 2500 bushel cap.

TOTAL —178 units

(9) Grain Cleaning Equipment

No. of Screen Type units—371
 No. of Cylinder units —343
 No. of Special units — 40

TOTAL —754 units

Approximate combined cleaning capacity per hour 287,000 bushels.

NOTE:

See Table No. 3 for listing of types of cleaning equipment installed in local Terminals to remove foreign material including other cereal grains generally referred to by elevator operators as dockage and separate cars of mixed grain into their respective groups.

(10) Grain Drying Equipment

Some 22 of the Lakehead Harbour's 25 Terminals are equipped with grain drying equipment. There are 30 drier units with a combined drying capacity of 22,700 bushels per hour. Units vary from 300 to 1000 bushels per hour capacity with an average of 748 bushels per hour.

Grain drying is accomplished by passing dry heated air through the grain. Drier units are provided with intermittent discharge mechanisms and may be arranged for both continuous flow or batch drying.

Driers are rated on their ability to reduce the moisture content of grain. For instance a 1000 bushel unit would be required to reduce the moisture in the grain by 5% when operating at 180 °F and with humidity not over 80% at a rate of 1000 bushels per hour without damage to the quality of the grain.

The purpose of reducing the moisture content in grain is to enable the elevator operator to store it in a bin without the hazard of deterioration by heating, etc. Grain with a moisture content in accordance with the percentage limitations established by the Canada Grain Act is considered to be in warehousing condition and may be stored indefinitely without resulting damage.

The heating unit in the drier installation may be fired with coal, oil or gas.

(11) Shipping Capacity to boxcars

104 cars per hour can be loaded out via 84 car spouts. All Terminals are equipped for car loading

(12) Shipping capacity to vessels

All Terminals are equipped with boat loading spouts. Our survey indicates that 1,380,000 bushels per hour can be loaded out via 128 boat spouts of which 16 are high level provided for convenient ocean vessel loading.

(13) Mileage of Rubber Belting

Conveyor Belts —52.86 miles
 Elevator Leg Belts —28.58 miles

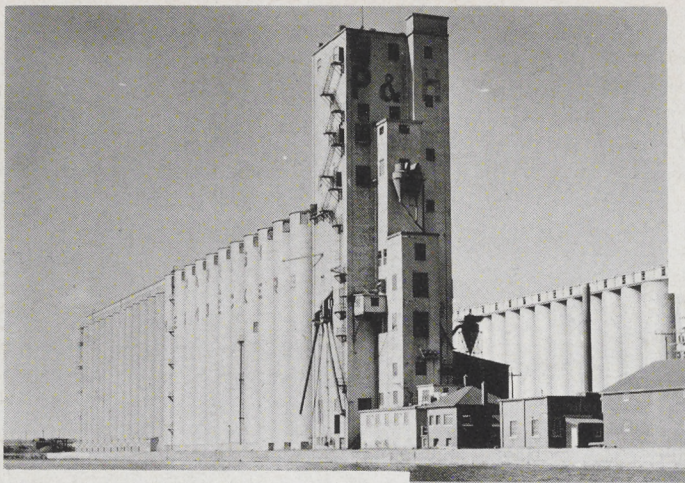
TOTAL —81.44 miles for all 25 plants.

(14) Screening Pelletizing Plants

Three Terminals have provided pelletizing equipment with a total estimated production of 90,000 tons of pellets per year.

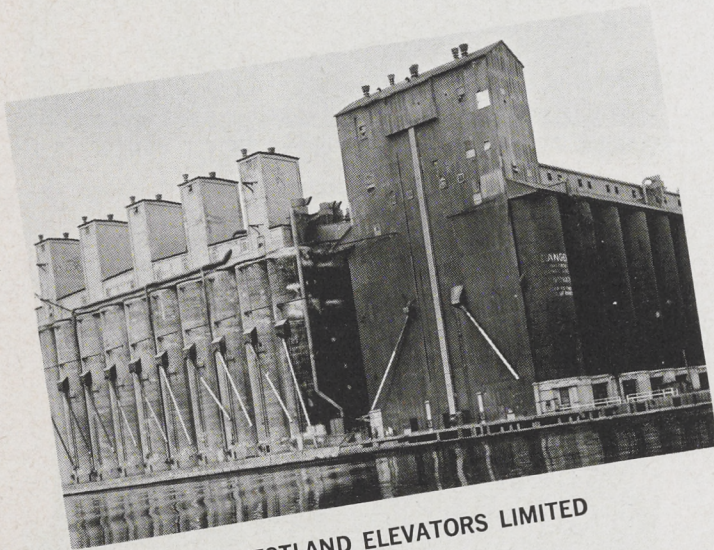
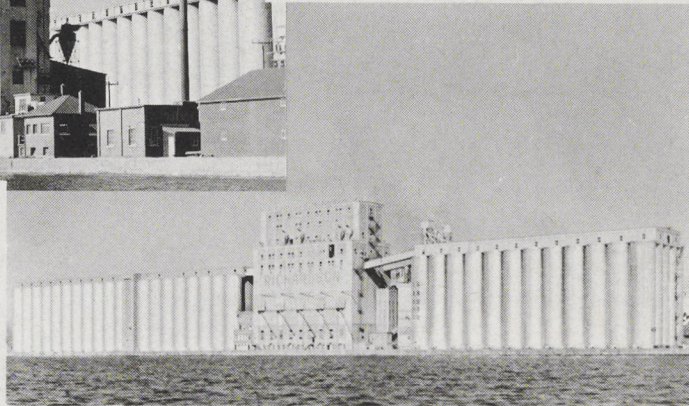
The combined figures set out above covering the various basic operations are based on the information supplied by the operating Superintendents at the various plants. The capacity for unloading cars per hour at the Elevators is, in our opinion, conservative and represents what is considered to be the normal output. The maximum





**SUPERIOR ELEVATOR COMPANY LIMITED
PARRISH & HEIMBECKER**

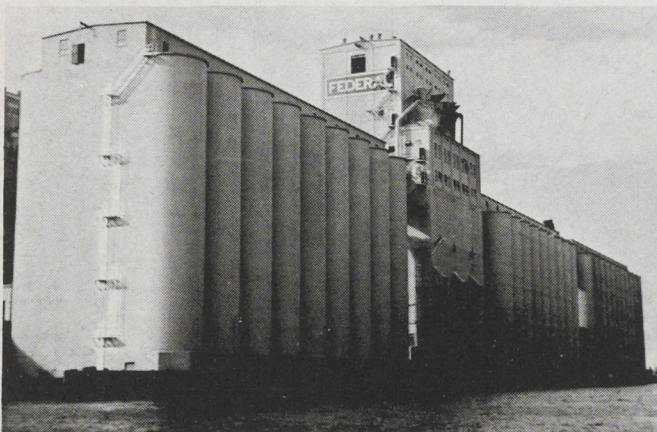
RICHARDSON TERMINALS LIMITED



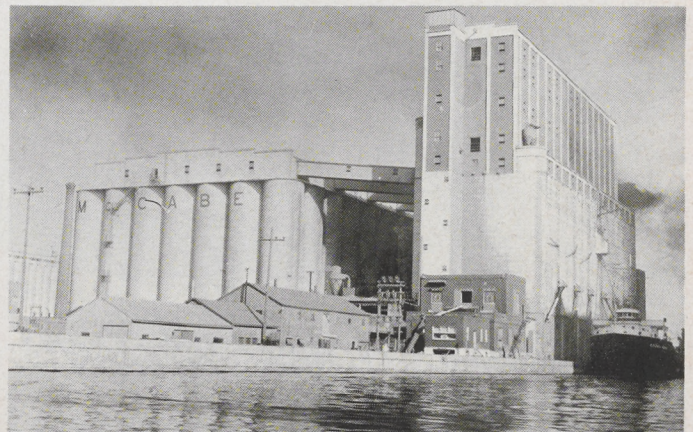
WESTLAND ELEVATORS LIMITED



**FEDERAL GRAIN LIMITED
NORTHWESTERN TERMINAL**



**FEDERAL GRAIN LIMITED
STEWART TERMINAL**



McCABE GRAIN COMPANY LIMITED

potential for this operation, based on records already established where automatic car dumpers and where manual unloading shovel equipment are in use, would indicate that in some instances, under the most favourable overall operating conditions, the unloading figures for cars unloaded in an 8 hour day were 50% greater than the average given.

Dealing with the capacity for shipping grain to lake freighters we would point out that during the week of

December 7, 1961, the total grain loaded on vessels eastbound from the Lakehead was 20,608,000 bushels or an average of 3,443,666 bushels per day. based on a 5 day work week. It will be apparent therefore that based on the survey just completed and taking into consideration the added handling facilities made available since 1961 our Lakehead Harbour grain Terminals have not as yet been taxed to their full potential.

LAKE SHIPPERS' CLEARANCE ASSOCIATION

The contribution made by this organization in expediting the movement of grain is outstanding. Organized in 1909 by the grain shippers themselves it operates as a clearing house for grain documents, combining same from various shippers, whereby the maximum dispatch is rendered to vessels taking on cargo. In the same manner it augments movement by rail by arranging the most advantageous distribution of cars to terminals for loading with a minimum of switching operations.

Warehouse receipts issued by any Elevators are tenderable in satisfaction of any purchase of grain made in the grain markets. Without a clearing house for handling such documents a vessel would be required to take on grain at every Elevator against which the shipper held a warehouse receipt causing serious loss of time due to vessel movement in the Harbour. By combining warehouse receipts and permitting maximum loading at any one Elevator, the movement of grain is expedited and the cost of marketing same is kept at a minimum.

The Association, handling as it does all outward shipments, and having on call at the Terminal Elevators large quantities of grain at all times, is in a position to place boats at Elevators that are full and would otherwise have to close down for want of storage space. By this action the Association keeps all Elevators unloading cars to the maximum degree possible and the overall unloading capacity of the Port is maintained at its maximum at all times.

The operators of the Lake Shippers' Clearance Association have proven that it is rendering to the grain trade, the Terminals and the transportation companies a most valuable and indispensable service. It is admitted by all interests that the business of shipping and transporting grain could not be economically or successfully carried on without its activities.

THE GRAIN MOVEMENT

The chain of transportation facilities required to move our Western Canada grain from the farm to the several export outlets viz: westward to the Pacific Coast, north to Hudson Bay, east to the Lakehead and on to the Atlantic Ocean, includes some very important links. Our two great transcontinental railways, a number of Canadian shipping companies operating vessels on the St. Lawrence Seaway, together with ships from overseas under foreign registry, cooperate to provide this service.

RAIL TRANSPORTATION

The movement by rail from the wheat growing area to the seaboard averaged about 482 million bushels per

year requiring approximately 254,000 boxcars annually during the five year period 1957-8 to 1961-2 according to Board of Grain Commissioners for Canada statistics.

The impact of the 1965 Russian grain purchase in amount some 215 million bushels in itself will require approximately 114,000 boxcars and 500 ocean going shiploads according to transportation authorities. The delivery period for the Russian order terminates in July 1966 and the eastbound rail movement to the Lakehead for transshipping will average approximately 350 cars per day, Sundays included, to meet this schedule. Superimposed on the normal movement under the current boom economy in Canada the task confronting our railroads today will require a major effort on their part.

However the Canadian Pacific Railway and the Canadian National Railway have demonstrated that they can jointly delivered to their Lakehead marshalling yards over 1000 cars daily with existing rolling stock. Marshalling yard space at the Lakehead includes 126.1 miles of C.P.R. trackage and 93.08 miles operated by the C.N.R. It is a matter of record that during the crop year 1963-4, August 1st, 1963 to July 31st, 1964, grain deliveries to Lakehead Terminals by the C.P.R. and C.N.R. were as follows:

Canadian Pacific Railway	116,511 cars
Canadian National Railway	111,030 cars
TOTAL	227,541 cars

The maximum calendar monthly delivery in November 1963 was as follows:

Canadian Pacific Railway	15,000 cars
Canadian National Railway	15,664 cars
TOTAL for month	30,664 cars
Average per day	1,022 cars

The Elevators operating on a 22 working day month basis unloaded the cars delivered in November at a rate of approximately 1400 cars per working day.

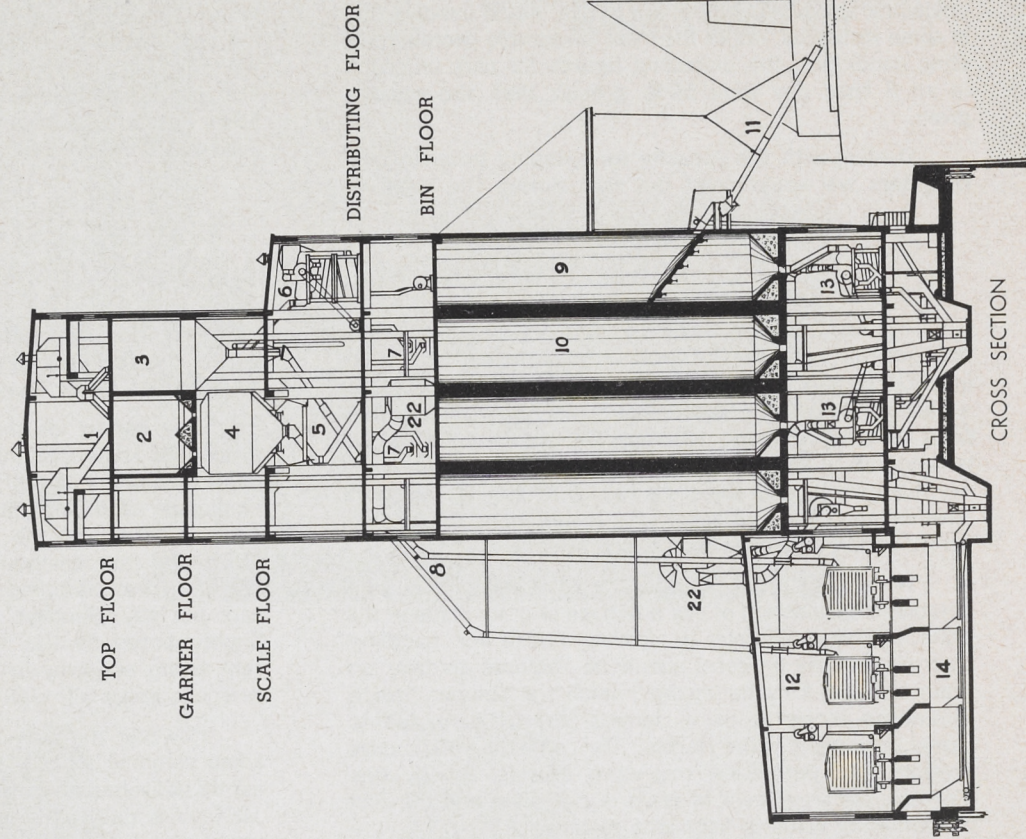
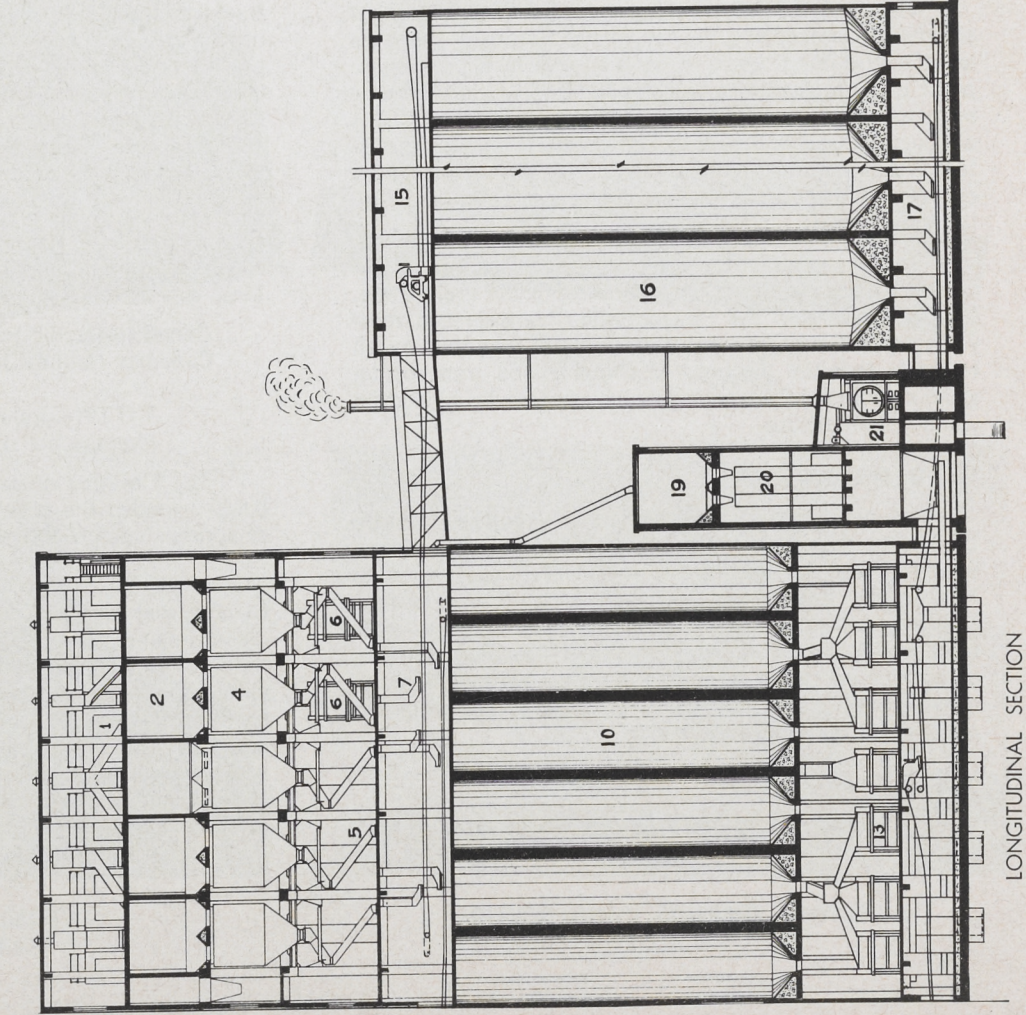
It will be of interest to note that with existing diesel engine power solid trains of 125 loaded grain cars are moved regularly to the Lakehead by both railroads. These trains are roughly one and one half miles long. Trains of empty grain cars returning to the West for reloading



TYPICAL TERMINAL GRAIN ELEVATOR AT THE LAKEHEAD HARBOUR

LAKEHEAD HARBOUR COMMISSION

- | | | |
|--|--------------------------|----------------------|
| 1. DISCHARGE SPOUTS FROM ELEVATOR LEGS | 8. CAR LOADING SPOUTS | 15. STORAGE CUPOLA |
| 2. SCALE GARNER | 9. SHIPPING BIN | 16. STORAGE BINS |
| 3. CLEANER GARNER | 10. WORKHOUSE BIN | 17. STORAGE BASEMENT |
| 4. HOPPER SCALE | 11. BOAT LOADING SPOUT | 19. DRIER GARNER |
| 5. MAYO AND TELESCOPIC DISTRIBUTING SPOUTS | 12. CAR UNLOADING SHED | 20. DRIER |
| 6. SCREENINGS SEPARATOR | 13. RECEIVING SEPARATORS | 21. BOILER HOUSE |
| 7. LOADING SPOUTS TO STORAGE BELTS | 14. RECEIVING HOPPERS | 22. DUST COLLECTORS |



handle in excess of 200 cars in some cases.

During the rush season before the close of navigation on the St. Lawrence Seaway, grain cars numbering 1,400 could arrive daily via our two railroads, be unloaded at our Terminals, and returned to Western Canada's country elevators for further grain shipments.

The survey shows that with favourable operating conditions including appropriate weather in Western Canada and vessel space being available at the Lakehead the 1963-4 average handling record can be greatly exceeded.

WATER TRANSPORTATION

With the splendid service rendered by the Lake Shippers' Clearance Association which expedites the rapid loading of the great lake freighters and ocean going vessels, the Lakehead Harbour Elevators, based on combined survey figures, have a maximum shipping potential of 13 million bushels per day. This quantity could be loaded out by its 25 Elevators. This figure is contingent on proper grades being available to meet export commitments, on vessel space being available here at all Elevators and depends on the ability of elevator facilities at Eastern Canada Terminals to unload the lake freighters and reload the grain to ocean bottoms with equal dispatch. Any delays at the St. Lawrence River Terminals or at lower Lake Ports due to lack of ocean cargo space would curtail the movement and our Lakehead output would of necessity slow down with reducing Port handling.

It would seem apparent, however, that the present urgency of demand of Canadian wheat particularly on the Continent of Europe and in other world ports would require adequate ocean vessel space being made available at our export outlets during the 1965-66 crop year.

With great lake bulk carriers operated by Canadian Companies and their affiliates, as per TABLE No. 4, carrying single cargoes up to 1,000,000 bushels approximately plus the ocean cargo vessels loading in the Port for direct shipment overseas, our water movement potential is, in our opinion, adequate. Cargoes as great as 1,000,000 bushels have been loaded out at a single Lakehead Terminal in ten hours. With their numerous hatches and wide unobstructed holds, lake vessels can be loaded much faster than ocean vessels.

As in the case of all modes of transportation it is essential that industrial harmony prevails and that labour unrest does not interrupt this phase of the transportation system.

During the calendar year 1964 some 963 lake freighters and 80 ocean vessels loaded grain at the Lakehead Harbour with a crop movement of 447,453,212 bushels. In addition to the above grain 151,497 tons of grain screenings including the pelletized product were loaded out on lake vessels. Our shipping potential to vessels greatly exceeds the 1964 crop movement.

(1) Electro-Magnets

Over each receiving conveyor belt an electro-magnet is located to remove from the incoming grain all metal particles such as nails, wire, bolts, and screws, etc., which would damage equipment used later in the cleaning process.

(2) Receiving Separators, Style "B", Monitor Type, Huntley Design

These separators provide an initial air separation which removes immature grains, light impurities, chaff, dust, etc. The grain drops onto a roughing screen where stones, sticks, strings and coarse refuse are taken off. Additional screening operations take place which remove other cereal grains and a further air suction is applied to remove impurities not caught in the initial air suction. The cleaned grain discharges to conveyors thence to an elevator leg. This equipment has been in use for many years. Local installations include 178 Style No. 11B, 27 Style No. 10B and 41 Style No. 9B, a total of 246 units.

(3) Monitor Screening Separators of the Huntley Co. Design

These machines have also been in service for many years for reclaiming usable grain and seeds from the screenings removed by the receiving separators. As many as nine sets of screens provide numerous separations and machines are equipped with two air separations. Local installations number 20 units. (Style "A")

(4) Monitor Flaxseed Separators of Huntley Design

Separators of this type are also used to clean flaxseed in many Terminals. Both screen and air separation are provided in this operation with remarkable efficiency. Local units installed number 24 style No. 8A.

All in all some 290 machines of Huntley design are in service in Lakehead Plants.

(5) Cylinder Type Separators of Superior Separator Co. Design

Equipment of this design is installed in many plants. These cleaners provide two air separations and up to five selective cylinder separations for handling various types of grain. Screenings are handled by similar equipment in a number of plants and some Terminals are equipped with Superior Width Graders for wheat and oat separation.

All in all 353 units of Superior Separator Design are in use at the Lakehead.

(6) Destoners

Of several designs are used for removing pebbles. nineteen units are installed.

(7) Threshers

For breaking up wheat heads.
Eight are in use.

(8) Cylinder Machines, Uniflow Type by Hart-Emmerson Co.

These machines are used in some plants. Styles No. 44 and No. 45. total of 56 units are in service.



WORKHOUSE DATA														STORAGE DATA		STATISTICS RE-TRACKING		
PICTURE ON PAGE	ELEVATOR	LOCATION ON WATERFRONT	REGISTERED OWNER	OPERATING COMPANY	DATE BUILT	TYPE OF CON-STRUCTION	CAPACITY IN BUSHELS	DATE BUILT	TYPE OF CON-STRUCTION	CAPACITY IN BUSHELS	TOTAL PLANT CAPACITY IN BUSHELS	ELEV. SWITCH BY	CAP. CAR LOADS	CAP. CAR EMPTY				
16	Canada Malting Co. Ltd.	Port Arthur Section South End Group	Canada Malting Co. Ltd.	Canada Malting Co. Ltd.	1923	Concrete	279,000	1923 1927 1961	Concrete Concrete Concrete	964,500 1,093,400 610,400 2,668,300	2,947,300	CNR	51	51				
6	Stewart Elevator	Port Arthur Section South End Group	Federal Grain Ltd.	Federal Grain Ltd	1923	Concrete	251,000	1923 1927 1960	Concrete Concrete Concrete	936,000 936,000 1,153,500 3,025,500	3,276,500	CNR CPR	54	54				
6	Northwestern	Fort William Section Upper Kam River	Federal Grain Ltd.	Federal Grain Ltd	1926	Concrete	326,000	1917 1919 1922	Concrete Concrete Concrete	255,000 470,000 1,856,000 2,581,000	2,907,000	CNR CPR	32	16				
16	Manitoba Pool No. 1	Port Arthur Section South End Group	Manitoba Pool Elevators	Manitoba Pool Elevators	1914 1962	Concrete Concrete	50,000 330,000 380,000	1914 1916 1962	Concrete Concrete Concrete	350,000 1,000,000 4,350,000 5,700,000	6,080,000	CNR CPR	56	60				
16	Manitoba Pool No. 2	Port Arthur Section Centre Harbour	Manitoba Pool Elevators	Manitoba Pool Elevators	1923	Concrete	100,000	1923	Concrete	1,300,000	1,400,000	CPR	36	36				
16	Manitoba Pool No. 3	Port Arthur Section South End Group	Manitoba Pool Elevators	Manitoba Pool Elevators	1924	Concrete	100,000	1923 1929 1960 1961	Concrete Concrete Concrete Steel	1,300,000 2,150,000 2,500,000 1,650,000 7,600,000	7,700,000	CNR	63	63				
16	Alberta Pool No. 9	Port Arthur Section North End Group	Alberta Wheat Pool	Manitoba Pool Elevators	1916	Concrete	80,000	1917 1927 1930	Concrete Concrete Concrete	400,000 520,000 1,000,000 1,920,000	2,000,000	CNR	40	40				
6	McCabe Grain Elevator	Port Arthur Section South End Group	McCabe Grain Company Ltd.	McCabe Grain Company Ltd.	1912	Concrete	580,000	1912	Concrete	2,670,000	3,250,000	CPR	68	68				
4	National	Fort William Section Mission Turning Basin	National Grain Co. Ltd.	National Grain Co. Ltd.	1909	Concrete	750,000	1909 1912	Concrete Concrete	2,500,000 2,500,000 5,000,000	5,750,000	CNR CPR	92	120				
6	Parrish & Heimbecker	Port Arthur Section South End Group	Parrish & Heimbecker Ltd.	Parrish & Heimbecker Ltd.	1922	Concrete	100,000	1922 1927 1961	Concrete Concrete Concrete	185,000 532,000 813,000 1,530,000	1,630,000	CPR	29	29				
4	Paterson's Elevator	Fort William Section — Upper Kam River	N. M. Paterson & Sons Ltd.	N. M. Paterson & Sons Ltd.	1918	Concrete	152,500	1918 1922 1928 1930	Concrete Concrete Concrete Concrete	499,000 648,200 980,000 1,720,300 3,847,500	4,000,000	CNR CPR	40	40				
6	Richardson Elevator	Port Arthur Section North End Group	James Richardson & Sons Ltd.	Richardson Terminals Ltd.	1918	Concrete	500,000	1918 1922 1930	Concrete Concrete Concrete	1,500,000 1,500,000 2,000,000 5,000,000	5,500,000	CNR CPR	75	75				
14	Saskatchewan Wheat Pool No. 4A	Port Arthur Section North End Group	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1917	Concrete and Brick	500,000	1917 1919 1923	Concrete Concrete Concrete	2,000,000 2,000,000 2,000,000 6,000,000	6,500,000	CNR CPR	92	92				
14	Saskatchewan Wheat Pool No. 4B	Port Arthur Section North End Group	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1918	Concrete	400,000	1923 1927	Concrete Concrete	500,000 1,000,000 1,500,000	1,900,000	CPR	60	60				
14	Saskatchewan Wheat Pool No. 5	Fort William Section Lower Kam. River	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1909	Tile	100,000	1909 1914 1917 1923	Tile Concrete Concrete Concrete	800,000 1,125,000 230,000 845,000 3,000,000	3,100,000	CNR CPR	53	58				
14	Saskatchewan Wheat Pool No. 6	Port Arthur Section Central Group	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1919	Concrete	600,000	1902 1904 1912	Tile Tile Tile	2,244,700 2,244,700 2,244,700 6,734,100	7,334,100	CNR	100	100				
14	Saskatchewan Wheat Pool No. 7	Port Arthur Section South Group	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1928	Concrete	900,000	1928 1948	Concrete Concrete	6,000,000 2,100,000 8,100,000	9,000,000	CNR	190	190				
14	Saskatchewan Wheat Pool No 8	Fort William Section Lower Kam. River	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1904	Steel	495,000	1909 1915 1928	Concrete Concrete Concrete	497,800 771,000 1,291,200 2,560,000	3,055,000	CPR	32	20				
16	Saskatchewan Wheat Pool No 10	Fort William Section Lower Kam. River	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1913	Concrete	261,000	1913	Concrete	1,489,000	1,750,000	CPR	42	42				
4	Saskatchewan Wheat Pool No 11	Fort William Section Lower Kam. River	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1907	Concrete	80,000	1907 1909	Tile Concrete	920,000 750,000 1,670,000	1,750,000	CPR	44	44				
14	Saskatchewan Wheat Pool No 12	Fort William Section Mouth Kam. River	Saskatchewan Wheat Pool	Saskatchewan Wheat Pool	1904	Wood	250,000	1904	Tile	1,500,000	1,750,000	CPR	36	36				
4	Searle Terminal Elevator and Feed Mill	Fort William Section Mission River	Searle Grain Co. Ltd.	Searle Grain Co. Ltd.	1928	Concrete	200,000	1928 1928 1930	Concrete Concrete Concrete	1,400,000 1,400,000 2,000,000 4,800,000	5,000,000	CNR CPR	87	72				
4	Searle Terminal "B"	Fort William Section Upper Kam. River	Inter-Ocean Grain Co. Ltd.	Searle Grain Co. Ltd.	1916	Wood	100,000	1916 1926	Concrete Concrete	400,000 500,000 900,000	1,000,000	CNR CPR	32	32				
4	United Grain Growers "A" Limited	Port Arthur Section North End Group	United Grain Growers Ltd.	United Grain Growers Ltd.	1927	Concrete	500,000	1927 1948 1961	Concrete Concrete Concrete	2,500,000 1,000,000 4,250,000 7,750,000	8,250,000	CNR CPR	84	84				
4	United Grain Growers (Thunder Bay) Limited	Port Arthur Section South End Group	United Grain Growers Ltd.	United Grain Growers Ltd.	1909	Wood	312,000	1909	Concrete	1,162,000	1,474,000	CNR CPR	51	51				
6	Westland "D"	Fort William Section Lower Kam River	Westland Elev. Ltd.	Westland Elev Ltd	1908	Steel & Tile	325,400	1912 1896 1913	Concrete Steel Concrete	1,766,000 1,602,000 4,167,600 7,535,600	7,861,000	CPR	136	100				
TOTALS FOR 25 ELEVATOR TERMINALS (14 in Port Artrur Section, 11 in Fort William Section)							8,621,900			97,543,000	106,164,900		1675	1633				

MINAL GRAIN ELEVATORS

BY LAKEHEAD HARBOUR COMMISSION

TRACKING			ELEVATOR		LEGS			SCALE EQUIPMENT		GRAIN CLEAN. EQUIP.		GRAIN DRY. EQUIP.		MARINE LEGS		OPERATING STATISTICS FOR AVE. 8 HR. DAY SHIPPING CAPAC.						MILEAGE RUB. BELTS		CAPACITY OF PELLETIZING PLANT FOR SCREENING
CAP. CAR. EMPTY	AUTO. CAR. DUMP	HAND OPER. SHOVS. PITS	NO. OF REC.	NO. OF SHIP.	NO. OF SPEC.	NO. REC. SCALE	NO. SHIP SCALE	UNIT CAP. IN BUSH.	SCREEN TYPE UNITS	CYL. TYPE UNITS	SPEC. UNITS	NO. UNITS	CAP. IN BUS. PER HOUR	NO.	CAP. IN BUSH. PER HR.	CAR LOAD. SPOUT	BOAT LOAD SPOUT	BOXCARS UNLOAD.	CLEANING CAPACITY IN BUSHELS	BXCR. LOAD OUT	TO VESSELS LOADING IN BUSHELS	CONVEYOR BELTS	ELEV. LEG BELTS	
51	1	3	2	3	3	2	3	2000	12	4	1	1	1000	—	—	4	3-45'	32	88,000	16	300,000	1.30	.70	—
54	—	6	2	3	3	2	3	2000	11	10	2	1	500	—	—	2	3-45'	54	50,000	20	300,000	1.50	.50	—
16	—	8	2	3	8	3	3	2000	35	13	2	2	1 - 1000 1 - 500	—	—	2	4-55'	48	144,000	16	400,000	1.41	.81	—
60	2	2	2	3	14	2	3	2500	20	25	1	1	1000	1	5,000	1	6-68'	100	150,000	100	650,000	3.75	1.50	—
36	—	5	2	1	4	2	1	2000	4	8	—	—	—	—	—	2	2-57'	40	85,000	20	240,000	0.80	0.50	—
63	—	6	2	4	5	2	4	1500	18	13	—	2	1 - 1000 1 - 500	1	8,000	4	3-50' 1-55'	60	100,000	40	500,000	3.75	.75	—
40	—	4	2	2	4	2	2	2000	10	9	2	1	500	—	—	2	2-57'	40	80,000	20	240,000	.55	.89	—
68	—	20	5	5	11	5	5	2000	19	18	2	2	1 - 800 1 - 800	—	—	5	7-40' 1-75'	40	120,000	17	400,000	1.25	1.50	—
120	—	20	5	5	9	5	5	2000	8	24	3	2	1 - 750 1 - 750	—	—	5	6-41' 1-80'	75	180,000	20	584,000	2.60	1.20	—
29	—	2	1	2	—	2	1	2000	3	5	1	1	400	—	—	2	2-55'6"	20	12,000	24	280,000	.87	.20	—
40	—	8	2	2	11	2	2	2500	14	8	—	2	1 - 150 1 - 650	1	8,000	2	2-50'	40	44,000	16	320,000	1.42	.76	—
75	—	12	3	4	8	3	4	2000	32	11	—	2	1 - 1000 1 - 1000	1	15,000	4	5-48'	90	80,000	15	500,000	2.30	1.20	1 Plant in use. (Data not available)
92	—	16	4	4	10	4	4	2000	18	17	3	1	1000	—	—	8	6-40'6" 2-83'	60	80,000	64	480,000	5.50	2.50	—
60	2	2	2	3	9	2	3	2000	11	17	5	—	—	—	—	2	6-52'0"	80	136,000	32	480,000			—
58	—	9	5	9	10	5	7	1600	23	13	3	—	—	—	—	4	6-45'	60	65,000	32	400,000	2.00	2.00	—
100	4	4	4	5	12	4	5	2000	12	21	—	1	1000	—	—	5	5-50' 2-90'	104	80,000	32	660,000	1.50	1.50	—
190	5	5	5	6	18	5	6	2000	28	27	3	1	1200	1	12,000	6	9-60' 2-85'	120	240,000	100	1,200,000	6.00	2.25	—
20	1	—	2	3	12	2	1	1 - 2000 2 - 500	6	11	1	—	—	—	—	1	2-46'6"	32	40,000	15	300,000	1.50	1.25	—
42	—	6	3	6	5	3	6	1600	5	10	2	1	900	—	—	4	3-40'0"	32	60,000	36	320,000	0.76	0.90	—
44	—	4	2	4	4	2	4	3 - 1600 3 - 2000	5	7	1	1	500	—	—	4	2-37' 1-60'	40	100,000	16	320,000	1.00	.75	—
36	—	8	4	4	4	4	4	1500	13	5	1	1	300	—	—	3	4-40'	16	19,000	24	250,000	.60	.70	—
72	3	2	2	2	6	3	4	2500	14	17	3	2	1 - 1000 1 - 500	—	—	2	2-47' 1-58' 1-66'6"	70	85,000	30	450,000	2.10	2.05	2 California Pelletizing Mach. 4 100 H.P. Grinders 1 50 H.P. Grinder 30,000 tons per year
32	—	8	1	3	3	1	3	3 - 2000 1 - 1400	3	5	—	1	500	—	—	1	3-47'10"	20	24,000	24	240,000	.95	.47	—
84	3	1	3	4	12	3	4	2500	25	20	1	2	1 - 1000 1 - 1000	—	—	4	4-27'9" 6-33'0"	90	140,000	50	500,000	4.50	1.50	1 unit 6 tons per hour 30,000 tons per year estimated
51	—	9	3	3	6	3	3	1500	9	9	1	1	1000	—	—	3	3-40'5"	30	48,000	32	350,000	1.05	.58	—
100	—	9	3	12	6	3	12	10 - 1500 5 - 1000	13	16	2	1	500	—	—	2	10	40	32,000	20	400,000	3.90	1.62	—
1633	21	179	73	105	197	76	102		371	343	40	30	22,700	5	48,000	84	128	1433	2,282,000	831	11,064,000	52.86	28.58	3 Plants

COMBINED TOTALS FOR OPERATING GRAIN ELEVATOR COMPANIES

Operating Statistics for Average 8 Hour Day																		
NAME OF COMPANY	Work House Capacity in Bush.	Storage Capacity in Bush.	Total Plant Capacity in Bush.	Elevator Trackage		Car Unl. Equip.		Grain Cleaning Equip.			Grain Drying Equip.		Shipping Capacities			Mileage Rubber Belts		
				Loads	Empties	Automatic Car Dumper	Hand Operated Shovel Pits	Screen Type	Cylinder Type	Special	No. Units	Capacity Bu. per Hr.	Boxcars Unloaded	Cleaning Capacity in Bush.	Boxcars Loaded Out	To Vessels Loading in Bush.	Conveyor Belts	Elev. Leg Belts
Canada Malting Co. Ltd.	279,000	2,668,300	2,947,300	51 Cars	51 Cars	1	3	12	4	1	1	1000	32	88,000	16	300,000	1.30	.70
Federal Grain Ltd.	577,000	5,606,500	6,183,500	86 Cars	70 Cars	—	14	46	23	4	3	2000	102	194,000	36	700,000	2.91	1.31
Manitoba Pool Elevators	660,000	16,520,000	17,180,000	195 Cars	199 Cars	2	17	52	55	3	4	3000	240	415,000	180	1,630,000	8.85	3.64
McCabe Grain Elevator	580,000	2,670,000	3,250,000	68 Cars	68 Cars	—	20	19	18	2	2	1600	40	120,000	17	400,000	1.25	1.50
National	750,000	5,000,000	5,750,000	92 Cars	120 Cars	—	20	8	24	3	2	1500	75	180,000	20	584,000	2.60	1.20
Parrish & Heimbecker	100,000	1,530,000	1,630,000	29 Cars	29 Cars	—	2	3	5	1	1	400	20	12,000	24	280,000	.87	.20
Paterson's Elevator	152,500	3,847,500	4,000,000	40 Cars	40 Cars	—	8	14	8	—	2	800	40	44,000	16	320,000	1.42	.76
Richardson Elevator	500,000	5,000,000	5,500,000	75 Cars	75 Cars	—	12	32	11	—	2	2000	90	80,000	15	500,000	2.30	1.20
Saskatchewan Wheat Pool	3,586,000	32,553,100	36,139,100	649 Cars	642 Cars	12	54	121	121	19	6	4900	544	820,000	351	4,410,000	18.86	11.85
Searle Grain Co.	300,000	5,700,000	6,000,000	119 Cars	104 Cars	3	10	17	22	3	3	2000	90	109,000	54	690,000	3.05	2.52
United Grain Growers Ltd. ...	812,000	8,912,000	9,724,000	135 Cars	135 Cars	3	10	34	29	2	3	2000	120	188,000	82	850,000	5.55	2.08
Westland Elevator	325,400	7,535,600	7,861,000	136 Cars	100 Cars	—	9	13	16	2	1	500	40	32,000	20	400,000	3.90	1.62
Total for Lakehead Harbour	8,621,900	97,543,000	106,164,900	1675 Cars	1633 Cars	21	179	371	343	40	30	21,700	1433	2,282,000	831	11,064,000	52.86	28.58

LAKEHEAD HARBOUR GRAIN TERMINALS

STORAGE CAPACITIES

1965 SURVEY FIGURES

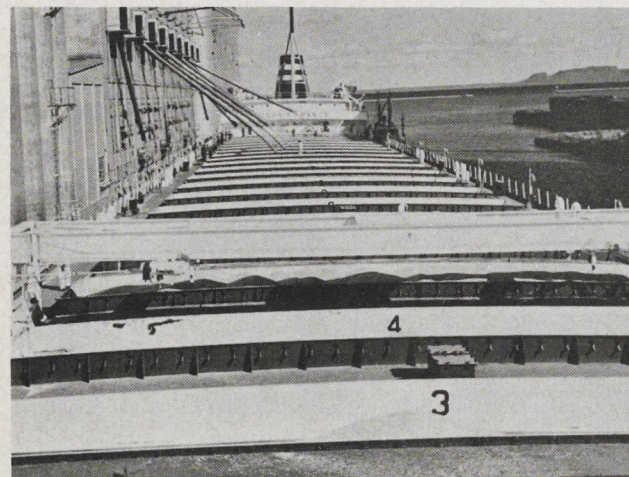
TABLE No. 2

ELEVATOR COMPANY	NO. OF PLANTS	WORKHOUSE CAPACITY IN BUSHELS	STORAGE CAPACITY IN BUSHELS	TOTAL ELEVATOR CAPACITY IN BUSHELS	PERCENTAGE OF TOTAL HARBOUR STORAGE
United Grain Growers Limited	2	812,000	8,912,000	9,724,000	9.2%
Saskatchewan Wheat Pool	8	3,586,000	32,553,100	36,139,100	34.0%
Manitoba Pool Elevators	4	660,000	16,520,000	17,180,000	16.2%
Federal Grain Limited	2	577,000	5,606,500	6,183,500	5.8%
Searle Grain Company, Limited	2	300,000	5,700,000	6,000,000	5.7%
McCabe Grain Company Limited	1	580,000	2,670,000	3,250,000	3.1%
Canada Malting Co. Limited	1	279,000	2,668,300	2,947,300	2.8%
Richardson Terminals Limited	1	500,000	5,000,000	5,500,000	5.2%
N. M. Paterson & Sons Limited	1	152,500	3,847,500	4,000,000	3.7%
Parrish & Heimbecker	1	100,000	1,530,000	1,630,000	1.5%
National Grain Company Limited	1	750,000	5,000,000	5,750,000	5.4%
Westland Elevators Limited	1	325,400	7,535,600	7,861,000	7.4%
TOTAL	25	8,621,900	97,543,000	106,164,900	100.0%

NOTE:

The total elevator capacities shown here are in accordance with data received on questionnaires and in some cases vary from the rated working capacities for Terminals.

In general, the trade considers 10% of space is required for normal handling operations which reduces the effective capacity to approximately 95,000,000 bushels.



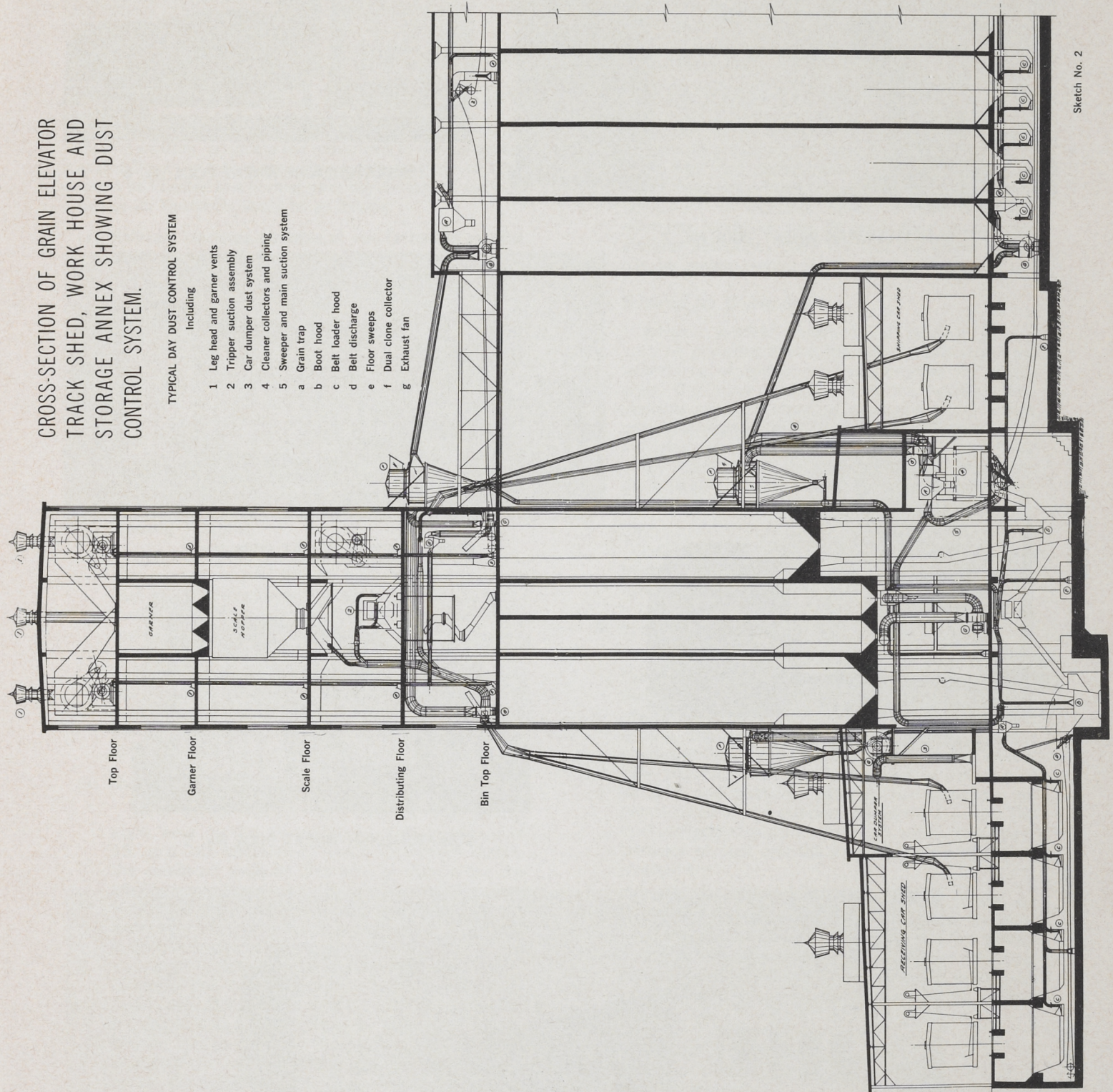
GRAIN BEING LOADED ON 730 FOOT VESSEL AT THE LAKEHEAD

CROSS-SECTION OF GRAIN ELEVATOR TRACK SHED, WORK HOUSE AND STORAGE ANNEX SHOWING DUST CONTROL SYSTEM.

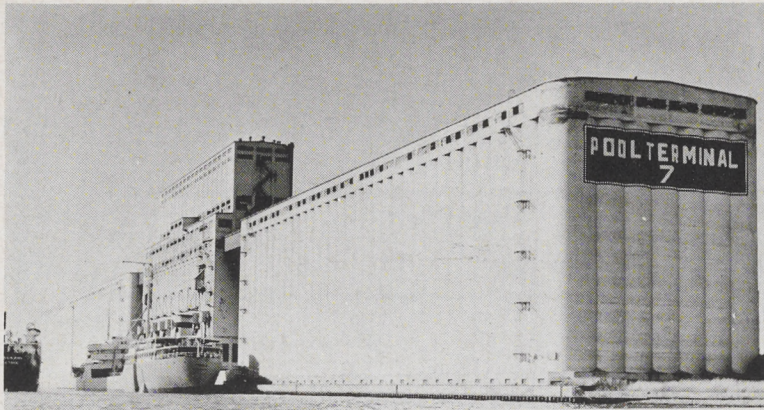
TYPICAL DAY DUST CONTROL SYSTEM

Including

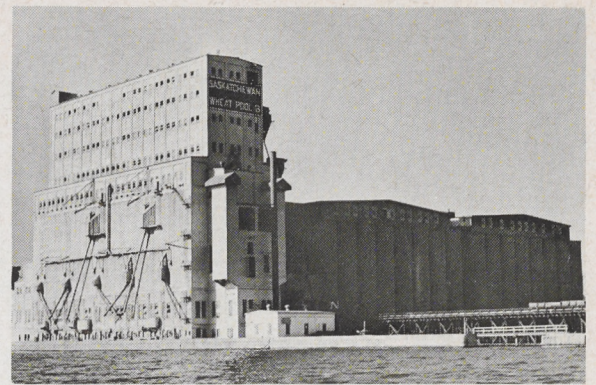
- 1 Leg head and garner vents
- 2 Tripper suction assembly
- 3 Car dumper dust system
- 4 Cleaner collectors and piping
- 5 Sweeper and main suction system
- a Grain trap
- b Boot hood
- c Belt loader hood
- d Belt discharge
- e Floor sweeps
- f Dual clone collector
- g Exhaust fan



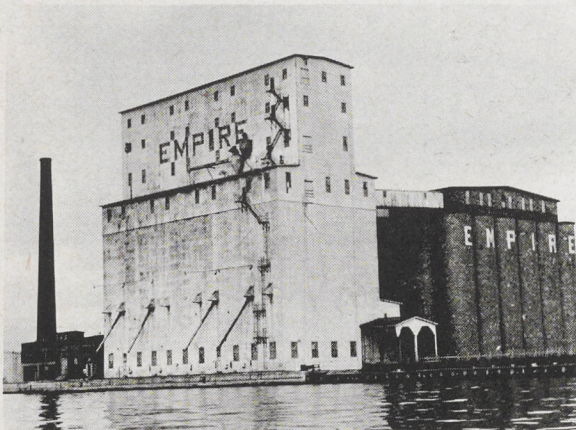
Sketch No. 2



SASKATCHEWAN WHEAT POOL No. 7



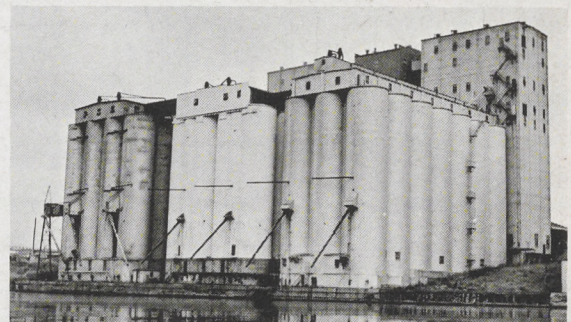
SASKATCHEWAN WHEAT POOL No. 6



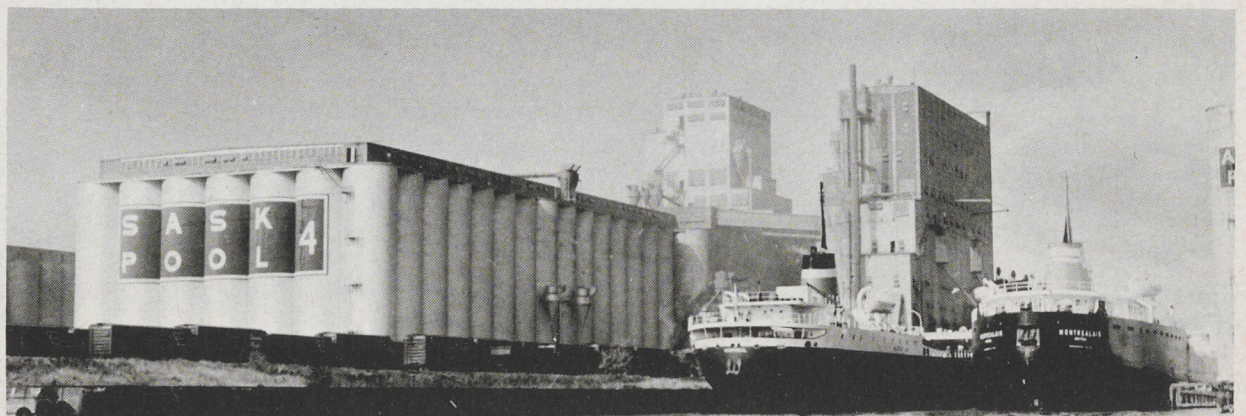
SASKATCHEWAN WHEAT POOL NO. 12



SASKATCHEWAN WHEAT POOL No. 8



SASKATCHEWAN WHEAT POOL No. 5



SASKATCHEWAN WHEAT POOL No. 4A & B

(9) Carter Disc Machines of Strong Scott Design

Carter Disc Machines for wheat and oat separation have been in use for many years in several plants. sixteen units are in service.

(10) Eureka Receiving Separators of S. Howe Co. Design

Machines of this design are in use in several Terminals. Twelve machines are in service.

FORECAST OF COMBINED POTENTIAL OF BASIC OPERATIONS AT OUR 25 TERMINAL ELEVATORS

Under entirely favourable operating conditions including weather, adequate rail movement to the Lakehead, availability of vessel space, etc., a fair estimate of what might be handled in a normal work day during the fall rush by our 25 Terminals would be as follows:

(1) Railroad Trackage available at our Terminals and Car Unloading Potential

Loaded cars spotted at Elevators (100% track full)—1675 cars all of which could be unloaded in a normal day's operation. Based on 2,000 bushels per car, 3,350,000 bushels per 8 hour day could readily be taken into the Terminals. On a conservative basic figuring three cars per hour for automatic car dumpers and one car per hour for hand operated shovel equipment the output would be 200 cars per hour for the 25 Terminals or approximately 1600 cars per 8 hour day. With five automatic car dumpers one of our largest Terminals has unloaded 283 cars in ten hours or 5.6 cars per hour per dumper.

(2) Cleaning Potential

Based on normal cleaning capacity of 287,000 bushels per hour the 3,350,000 bushels unloading from cars as above could be cleaned in 11 hours approximately. Cleaning operations, however, in grain Elevators can proceed on a 16 or 24 hour basis depending on the export requirements and the convenient availability of vessel space for shipment to Eastern Canada. On a 24 hour basis our Terminals' cleaning potential therefore is upwards of 6 million bushels with average grades and dockage content according to the survey data.

(3) Shipping to Vessels Potential

With vessel loading restricted to the normal eight hour day for the period April 15 to December 15, and not considering vessel movement delays, the combined shipping potential to vessels for the 25 Terminals based on 50% only of maximum capacity would be approximately 5.5 million bushels per eight hour day. This is about twice the 3,443,666 bushels per day record established in 1961. It was significant to note in passing that one single Elevator in one of our largest Elevator groups loaded onto a Great Lakes Bulk Carrier vessel 1,000,000 bushels in ten hours. It also demonstrated its ability to load 180,000 bushels to the same Great Lakes Bulk Carrier in a single hour and 550,000 bushels over a 4½ hour period averaging 122,000 bushels per hour on this occasion. Other Terminals have demonstrated their ability to load vessels at a comparable rate.

(4) Shipping to Cars Potential

Rail movement of grain subsequent to close of

navigation based on existing survey figures could proceed at a rate of 100 cars per hour or 800 cars per 8 hour day, approximately 190,000 bushels per hour, if market conditions required same and railway equipment was available. Under the most favourable operating conditions with 84 car loading spouts some elevator authorities point out that the above figures can be greatly increased.

(5) Potential for Drying Grain

Adverse weather conditions in Western Canada such as prevailed during the fall of 1965 stress the importance of having adequate facilities for drying grain. Our survey indicates that the Lakehead has available some 30 standard grain drier units with a combined capacity of 22,700 bushels per hour. This indicates a potential for drier use of ten cars per hour or 240 cars per 24 hour day, should wet and damp grain require treatment to reduce the moisture content of same and insure it was in warehousing condition.

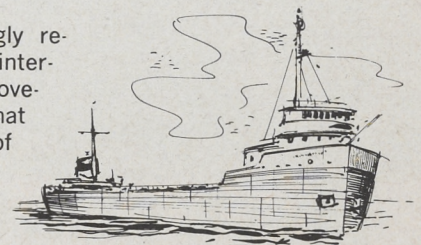
Drier units in general are rated at from 500 to 1000 bushels per hour, based on an average of 5% moisture extraction.

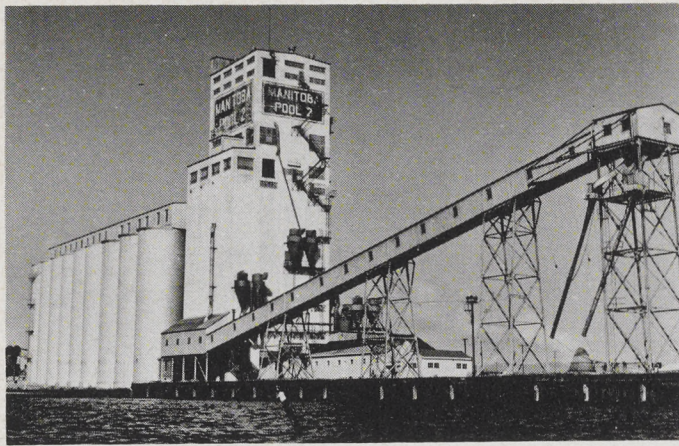
(6) Dust Collecting Systems

To eliminate the hazard of dust explosions and provide the best possible atmospheric working conditions for elevator employees, our Lakehead Elevators are equipped with the most modern systems of dust control. The movement of grain through the Elevator creates objectionable dust and to collect same wherever possible air suction is provided to collect dust particles and discharge same to dust collectors usually located on the exterior walls of the Elevator. The dust collectors separate out and retain the heavy particles of dust and the exhaust air discharges to atmosphere.

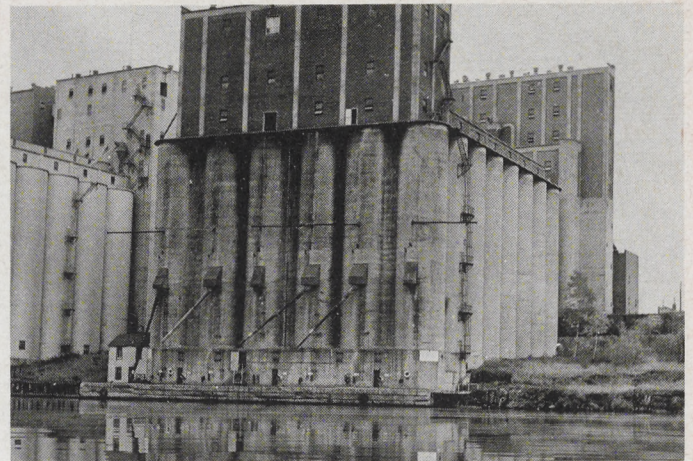
To illustrate the modern dust control system installed in a typical Lakehead Terminal Grain Elevator, your attention is drawn to sketch No. 2. This sketch clearly indicates the many locations of dust collecting equipment and the number of exhaust fans which provide the required air suction to operate the control system.

We would strongly recommend for those interested in the crop movement in Canada that they obtain a copy of the Canadian Wheat Board Bulletin No. 2 issued in

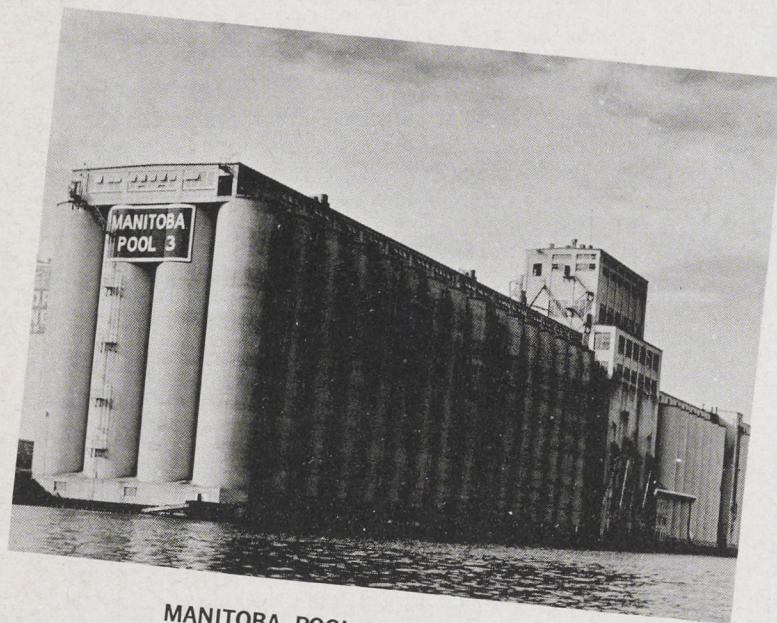




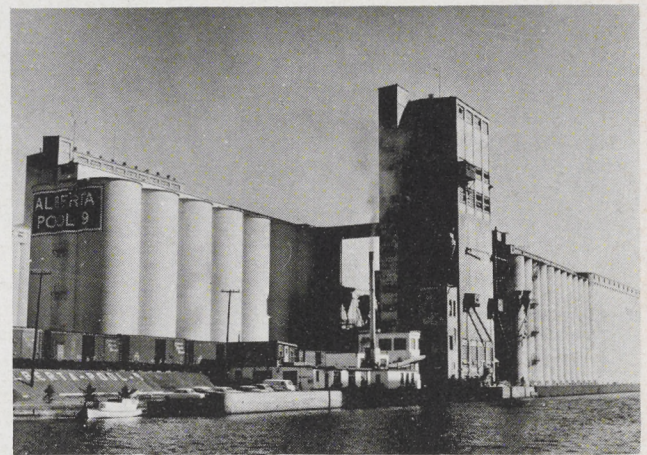
MANITOBA POOL ELEVATORS No. 2



SASKATCHEWAN WHEAT POOL No. 10



MANITOBA POOL ELEVATORS No. 3



ALBERTA POOL TERMINAL No. 9
(OPERATED BY MANITOBA POOL ELEVATORS)



MANITOBA POOL ELEVATORS No. 1



CANADA MALTING CO. LIMITED

September, 1963, dealing with the storage, transportation and grading of grain in Canada. This informative bulletin gives capacity statistics for Elevators in the interior and at all ports in Canada and explains in detail the control exercised by the Board of Grain Commissioners in the operation of our Elevators under the Canada Grain Act. It describes also the grain movement from the farm to the ultimate consumer. It outlines the facilities provided to handle grain shipments in the country, at our Lake Ports and on the seacoast. It explains the official inspection system used

to establish the grade of grain under consideration so as to maintain the high standard enjoyed by Canadian grain in the markets of the world.

The duties of the Canadian Wheat Board set up by the Canadian Government are explained. (This Board controls the sale of all grains entering commercial facilities. It regulates the delivery of all prairie grown wheat, oats and barley from the farm to country Elevators using the quota systems to obtain the orderly marketing of the exportable crop.)

AUTOMATIC GRAIN SAMPLERS

The identity of every car of grain unloaded at our terminals is usually preserved until the weight and grade of same has been established by representatives of the Board of Grain Commissioners for Canada. When this information has been obtained the Elevator operator is permitted to route the grain to a storage bin containing grain of the equivalent type and grade.

To insure an official representative sample of the grain being obtained automatic sampling machines are in use in

all modern grain Terminals in Canada and the U.S.A. Small metal buckets on moving chains pick up samples from the stream of grain on the belt conveyor. Every receiving conveyor belt is equipped with this device.

Shipments out of Terminal Elevators are sampled continuously by similar automatic samplers or by an official of the Board of Grain Commissioners of Canada to insure that the shipment meets the grade specifications in every respect.

SUMMARY

The survey, in addition to tabulating the facilities available at all Lakehead Elevators for receiving, cleaning, drying, and shipping grain in transit to Ports in Eastern Canada and for direct shipping overseas, clearly indicates that the maximum potential for these operations, based on records already established, has never been fully realized.

It would seem apparent therefore that to insure an increased movement of grain through the Lakehead Har-

bour, more grain from Western Canada of the type required to meet the demand of world markets must be delivered to our Terminals. By maintaining a constant flow of cars to our Terminal Elevators their combined unloading capacity will be greatly increased.

It is equally important that adequate vessel space be made available to enable shipping operations to proceed at a speed in keeping with car deliveries over rail transportation.

SCHEDULE OF CLEANING EQUIPMENT INSTALLED IN LAKEHEAD ELEVATORS

1965 Survey Data

Table No. 3

(1) Huntley Manufacturing Co.

Receiving Separators (Screen Type)

1. Style No. 11B
2. Style No. 10B
3. Style No. 9B

Flax Separators (Screen Type)

Style No. 8A

Screening Separator (Screen Type)

Style No. 9A

(2) Superior Separator Co. Equipment

1. Style No. CC16A—No. 8 Terminal
No. CC12A—Indent Cylinder Types
2. Style No. S-6—Screen Types
3. Width Graders
4. Fractionating Aspirators—Destoners

(3) Hart-Emmerson Uniflows No. 44 and No. 45 —Indent Cylinder Type

(4) Carter Disc No. 5—Strong Scott Co. —Disc Type

(5) Destoners—Kipp Kelly Co.

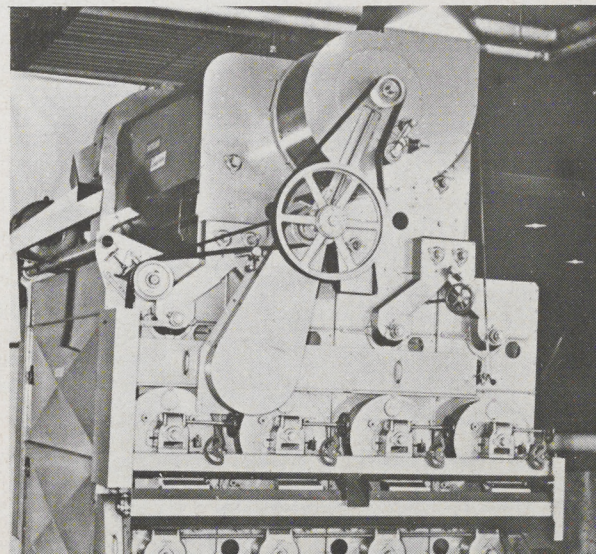
(6) Eureka Receiving Separators—S. Howe Co.

(7) Threshers—Woodside Bros.

NOTE:

Above schedule based on questionnaire completed 1965.

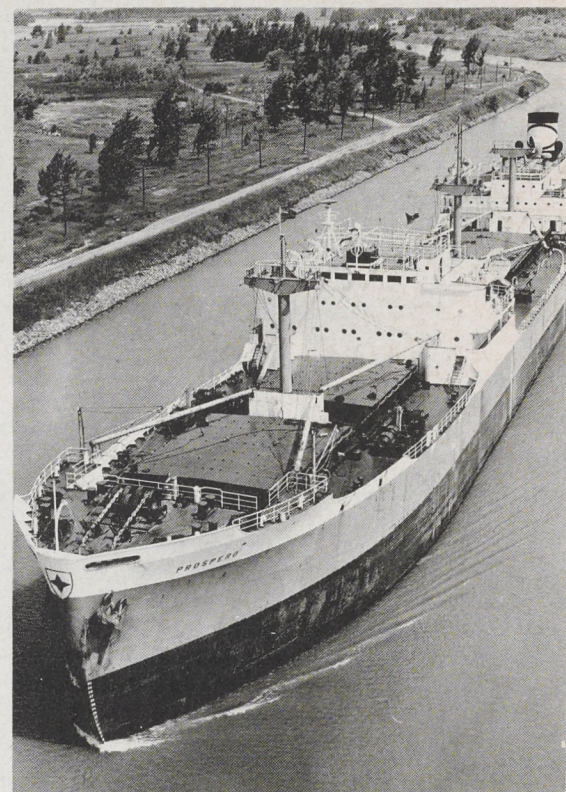
Superior Grain cleaning machine of the type used in Terminal Elevators



Both Lake and Salt Water Vessels Call at the Lakehead Terminals



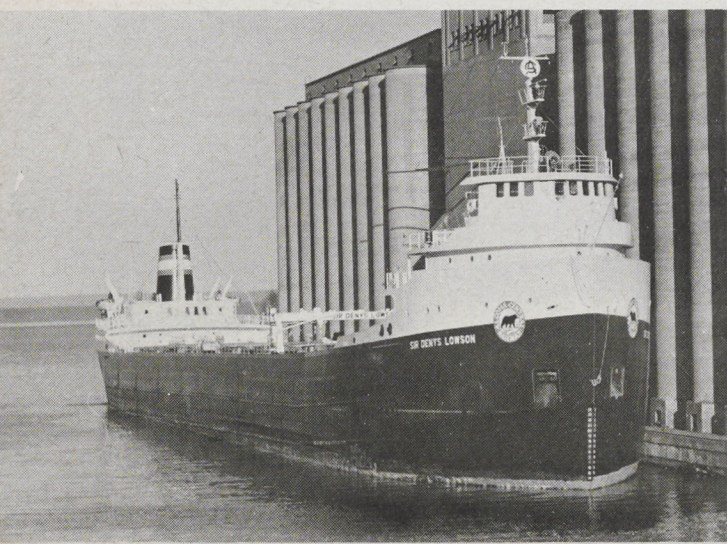
M. V. "RED WING," Upper Lakes Shipping Ltd., Toronto, Ontario



M. V. "PROSPERO"
Bowring Steamship Ltd., London, England



M. V. "MANCHESTER RENOWN"
Manchester Liners Ltd., Manchester, England



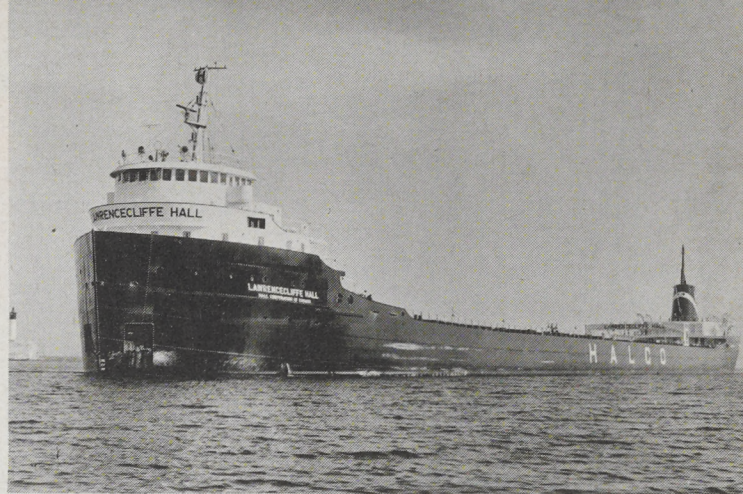
M. V. "SIR DENYS
LOWSON"
Algoma Central & Hud-
son Bay Railway Com-
pany, Sault Ste. Marie,
Ontario



S. S. "GROVEDALE"
Westdale Shipping Limited, Montreal, Quebec



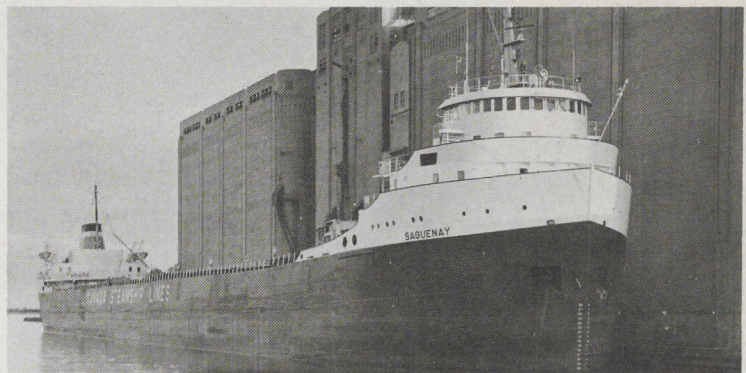
M. V. "SILVER ISLE"
Mohawk Navigation Co. Limited, Montreal, Quebec



M. V. "LAWRENCE-CLIFFE HALL"
Hall Corporation of Canada
Montreal, Quebec



M. V. "JOHN A. FRANCE"
Scott Misener Steamships Limited
St. Catharines, Ontario



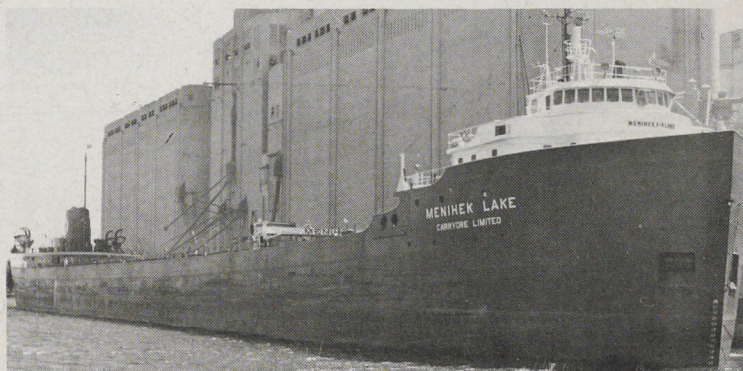
M. V. "SAGUENAY"
Canada Steamship Lines Limited, Montreal, Quebec



S. S. "COMEAUDOC"
N. M. Paterson & Sons Limited, Fort William, Ontario



S. S. "HAMILTONIAN"
Papachristidis Co. Ltd., Montreal, Quebec



S. S. "MENIHEK LAKE"
Carryore, Limited, Montreal Quebec



Algoma Central &
Hudson Bay
Railway Co.



Canada Steamship
Lines Ltd.



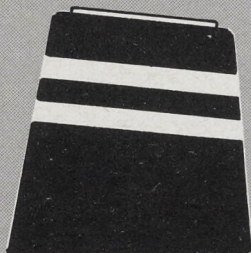
Carryore Limited



Yankanuck
Steamships, Ltd.



Upper Lakes
Shipping, Ltd.



Scott Misener
Steamships Ltd.



Reoch Steamship
Co. Ltd.



Quebec & Ontario
Transportation
Co. Ltd.



N. M. Paterson &
Sons Steamship
Division



Papachristidis
Shipping Ltd.

**DOMESTIC VESSEL COMPANIES AND SUBSIDIARIES
USING LAKEHEAD HARBOUR IN 1964 AND
ENGAGED IN TRANSPORTING GRAIN**

ALGOMA CENTRAL & HUDSON BAY RAILWAY CO.

CANADA STEAMSHIP LINES LTD.

CARRYORE LIMITED

HALL CORPORATION OF CANADA

HINDMAN TRANSPORTATION CO. LTD.

MOHAWK NAVIGATION CO. LTD.

PAPACHRISTIDIS CO. LTD.

N. M. PATERSON & SONS LIMITED

QUEBEC AND ONTARIO TRANSPORTATION CO. LTD.

SCOTT MISENER STEAMSHIPS, LIMITED

UPPER LAKES SHIPPING LIMITED

WESTDALE SHIPPING LTD.

YANKCANUCK STEAMSHIPS LIMITED



Hall Corporation
of Canada



Hindman
Transportation
Co. Ltd.



Mohawk
Navigation Ltd.

(Vessels under Foreign Registry are not listed above)

OUR THANKS

*For assistance in the preparation of this report the
Lakehead Harbour Commission is indebted to the Management
and Local staffs of the following Elevator Companies*

- THE SASKATCHEWAN WHEAT POOL
- THE MANITOBA POOL ELEVATORS
- THE FEDERAL GRAIN LIMITED
- THE UNITED GRAIN GROWERS LIMITED
- THE SEARLE GRAIN COMPANY, LIMITED
- NATIONAL GRAIN COMPANY LIMITED
- THE CANADA MALTING CO. LIMITED
- THE RICHARDSON TERMINALS LIMITED
- N. M. PATERSON & SONS LIMITED
- THE McCABE GRAIN COMPANY LIMITED
- PARRISH & HEIMBECKER LTD.
- WESTLAND ELEVATORS LIMITED
- ALBERTA WHEAT POOL
- BOARD OF GRAIN COMMISSIONERS FOR CANADA

The local management of the following companies

- THE CANADIAN PACIFIC RAILWAY COMPANY
- THE CANADIAN NATIONAL RAILWAYS
- THE LAKE SHIPPERS' CLEARANCE ASSOCIATION

Certain photographs and sketches were supplied by.

- C. D. HOWE COMPANY LIMITED
- NORTHLAND MACHINERY SUPPLY CO. LTD.

The Lakehead Harbour Commission is deeply appreciative of the services rendered by Mr. R. B. CHANDLER, B.A. Sc., P. Eng., M.E.I.C., in the preparation of this report.

A former consulting engineer with wide experience in Industrial Harbour Development in ports across Canada and the U.S.A. including the bulk of grain elevator plants on the Lakehead Harbour, Mr. Chandler served as Chairman of the Harbour Commission and was a member of the Board during the years 1959 to 1965.

We extend to him our sincere thanks for his preparation and analysis of the questionnaires submitted by the Elevator Companies and his observations thereto.



Canadian Pacific



A farm yield of 51,000 acres is required to produce a vessel cargo of 1,000,000 bushels.

It would take approximately five trains totalling 566 boxcars to transport this grain from the prairie country elevators to the terminal elevators at the Lakehead in order to fill the holds of ONE of these giant lake freighters.

These million-bushel bulk carriers are approximately 730' long and 75' wide and draw 25½ feet of water.

